

## Seed Dispersal of Black Wattles *Acacia auriculiformis* by Birds

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*Acacia* is Australia's largest genus of Australian flowering plants yet its seed dispersal is poorly understood. Recent studies have shown that there are three distinct seed dispersal "syndromes" (Davidson & Morton 1984; O'Dowd and Gill 1986): ant-dispersed arillate species, bird-dispersed arillate species, and abiotic-dispersed non-arillate species. The seeds of bird-dispersed wattles tend to have large, colourful (yellow to red), lipid-rich arils, and are retained in the canopy, while those of ant-dispersed species typically have smaller, whitish, lipid-poor arils and are presented inconspicuously on the ground. Colourful arils are more likely to attract avian dispersal agents since birds, in contrast to insects, have well developed colour vision, often showing preferences for red and yellow (see Davidson & Morton 1984, Ford & Paton 1986). Research on both *Acacia* seed dispersal and frugivorous birds has to date been concentrated in the arid and temperate zones.

The Black or Ear-pod Wattle *A. auriculiformis* is widely distributed in the Top End (Brock 1988; Wightman & Andrews 1989), and is a common street and garden tree in Darwin (Hearne 1975). One of the distinctive characteristics of the species is the long bright orange aril by which each of the black seeds hangs from the pod. I observed passerine birds of ten species (Table 1) feeding on the arils of large *A. auriculiformis* in Darwin on seven separate occasions between March and August (mostly July), 1986-89 inclusive. These species vary considerably in size and diet, and four are principally Dry Season visitors to the Top End (Table 1). Only the Figbird and the two orioles are primarily frugivorous.

In most cases the birds were observed to pluck the aril with its attached seed, then shake or bash it on a branch before ingestion took place. In two instances clumps of detached seeds and aril fragments were found on the ground directly below the feeding site. A Black-faced Cuckoo-shrike also fed on detached arils from the road below one tree. Birds appeared to swallow the seed along with the aril on several occasions. Such seeds would probably pass through the gut in tact (see Forde 1986) but no seed-containing scats were found in the course of my observations.

Davidson & Morton (1984) predicted bird dispersal for *A. auriculiformis* based on its bright aril colour, and this is supported by my observations. The measurements given for this species in O'Dowd and Gill (1986) also strongly suggest ornithochory. Of the 92 species of *Acacia* they examined, only 10 possessed arils longer than 20 mm and 14 had arils with a lipid content of over 50%; *A. auriculiformis* arils averaged 24 mm in length and had a lipid content of 55%. Moreover, investment in dispersal per diaspore (seed plus aril) was 15%, much closer to the average value for bird-dispersed species than for ant-dispersed species (19 vs 7% respectively).

TABLE 1 List of species observed feeding on arils of *A. auriculiformis*

Species	Size (cm)	Food*	Status †
Black-faced Cuckoo-shrike <i>Coracina novaehollandiae</i>	33	I, F	Dry
White-bellied Cuckoo-shrike <i>C. papuensis</i>	26	I, F	Year-round
Varied Triller <i>Lalage leucomela</i>	20	I, F	Year-round
White-winged Triller <i>L. seuerii</i>	18	I	Dry
Rufous-banded Honeyeater <i>Conopophila albogularis</i>	13	I, N	Year-round
White-gaped Honeyeater <i>Meliphaga unicolor</i>	20	I,F,N	Year-round
Figbird <i>Sphecotheres viridus</i>	27	F	Year-round
Yellow Oriole <i>Oriolus flavocinctus</i>	27	F,(I)	Year-round
Olive-backed Oriole <i>O. sagittatus</i>	26	F,(I)	Dry
White-breasted Woodswallow <i>Artamus leucorhynchus</i>	17	I	Dry

\* I, insects; F, fruit; N, nectar

† Season of greatest abundance in the Darwin region (Thompson & Goodfellow 1987; pers. obs.)

O'Dowd and Gill (1986) suggest that the present predominance of ant-dispersed *Acacia* in Australia may be a result of the nomadic habits of many avian frugivores, and the greater reliability of ants. *Acacia auriculiformis* is possibly exceptional among its congeners in that it grows most abundantly in coastal and lowland monsoon vine forests, and along perennial watercourses (Wightman & Andrews 1989). These habitats are patchily distributed and often separated by long distances. They are also the main habitats of figbirds, orioles and other frugivorous birds. Moreover the ant faunas of vine forests are impoverished relative to savannas (A. Andersen, pers. comm.). Thus *A. auriculiformis* probably benefits from the long distances travelled by birds, especially flocks of figbirds, between patches of vine forests. Bird dispersal might also account for the pioneering tendency of this species (e.g. Wightman & Andrews 1989). The efficiency of bird dispersal in *A. auriculiformis* would provide a fruitful area of research.

## References

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